

REMARKS

This Amendment is fully responsive to the non-final Office Action dated December 17, 2007, issued in connection with the above-identified application. Claims 26-47 are all the claims pending in the application. With this Amendment, claims 26-42 and 44-48 have been amended; and claims 48-56 have been added. No new matter has been introduced by the amendments made to the claims, or by the new claims added.

At the outset, the Applicant thanks Examiner Gaddy for granting the Interview conducted with the Applicant's representative on February 25, 2008. During the Interview, distinguishable features of independent claim 26 (e.g., as an exemplary independent claim) and the Levinson reference were discussed in detail.

Specifically, it was noted that claim 26 is directed to creating a standard model for performing speech recognition using statistics of at least one reference model, which is selected based on usage information. On the other hand, Levinson discloses using a reference model directly for performing speech recognition. In other words, Levinson fails to disclose or suggest the creation of a standard model from at least one reference model, wherein the created standard model is then used for speech recognition.

During the interview, possible claim amendments (to expedite prosecution of the application) were also discussed. For example, it was suggested that the independent claims be amended to point out that "the reference model storing unit stores a plurality of reference models" which are probability models showing an acoustic characteristics having a specific attribute. It was also suggested to amend the independent claims to clarify that the "standard model is created from at least one reference model, and the standard model is used for performing speech recognition."

At the conclusion of the Interview, the Examiner indicated that the suggested claim amendments would help to distinguish the present invention over the cited prior art. However, the Examiner also indicated that further search and consideration would be necessary before making a final determination regarding the allowability of the claims.

To facilitate the Examiner's reconsideration of the application, the Applicant has amended the abstract to correct minor informalities. A replacement abstract has been provided.

In the Office Action, the Examiner objected to the title for being non-descriptive. Additionally, the Examiner suggested the following new title: “Standard-Model Generation For Speech Recognition Using A Reference Model.” The Applicant has amended the title as suggested by the Examiner. Withdrawal of the objection to the title is respectfully requested.

In the Office Action, claim 37 has been rejected under 35 USC 112, second paragraph, as being indefinite. Specifically, the Examiner alleged the “reference model preparing unit” limitation in claim 37 is unclear and suggested a revised format for the claim. The Applicant has amended the format of claim 37 to be consistent with the suggestions made by the Examiner. Withdrawal of the rejection to claim 37 under 35 USC 112, second paragraph, is respectfully requested.

In the Office Action, claims 45 and 47 have been rejected under 35 USC 101 for being directed to non-statutory subject matter. Specifically, the Examiner alleged that the claims are directed to software *per se*, which is non-statutory. The Examiner also suggested amending the claims to point out that the program recited in the claims is encoded or stored on a computer-readable medium. The Applicant has amended claims 45 and 47 as suggested by the Examiner. Specifically, the claims have been amended to point out that the recited program is “stored on a computer-readable medium.” Withdrawal of the rejection to claims 45 and 47 under 35 USC 101 is respectfully requested.

In the Office Action, claim 26 is rejected under 35 USC 102(b) as being anticipated by Levinson (US Patent No. 4,587,670, hereafter “Levinson”).

The Applicant has amended claim 26 to be consistent with the suggestions made during the Examiner Interview with the Applicant’s representative on February 25, 2008. Specifically, claim 26 has been amended to point out that the reference model storing unit of the present invention is “operable to store a plurality of reference models which are probability models showing an acoustic characteristic having a specific attribute.” The above amendment to claim 26 is fully supported by the Applicant’s disclosure (see e.g., Fig. 3; Fig. 11; pg. 12, lines 16-24; and pg. 28, line 14-pg. 29, line 9).

As pointed out during the Examiner Interview, claim 26 is directed to creating a standard model using statistics of at least one selected reference model from a plurality of

reference models stored in a reference model storing unit. Creating the standard model from at least one of the stored reference models creates a high-precision speech recognition model that is not available using conventional speech recognition techniques.

In the Office Action, the Examiner relied on Levinson for disclosing a reference model storing unit and standard model creating apparatus for performing speech recognition. Specifically, the Examiner relied on col. 5, lines 12-24; col. 6, lines 6-15; and col. 12, lines 42-62 of Levinson for disclosing the above features. However, col. 5, lines 12-24 of Levinson discloses a speech recognizer that recognizes speech patterns applied to an electroacoustic transducer. Additionally, Levinson at col. 6, lines 6-25 describes the use of a Markov model in the speech recognizer; and col. 12, lines 42-62 merely discloses an example of speech recognition using the Markov model.

Thus, as noted during the Examiner Interview, Levinson simply discloses speech recognition using (directly) a reference model (i.e., Markov model). In other words, Levinson discloses speech recognition based on a direct relationship between the inputted speech and the reference model in the speech recognizer. Levinson fails to disclose or suggest the creation of a standard model from the reference model, or storing a plurality of reference models that can be selected for creating the standard model.

On the other hand, the present invention (as recited in claim 26) is directed to creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the created standard model is used for performing speech recognition. Thus, in the present invention (as recited in claim 26), there is a direct relationship between the inputted speech and a standard model for speech recognition; not between the inputted speech and the reference model.

Therefore, claim 26 (as amended) is clearly not anticipated or rendered obvious by Levinson.

In the Office Action, claims 27 and 28 have been rejected under 35 USC 103(a) as being unpatentable over Levinson in view of Ittycheriah et al. (US Patent No. 5,895,447, hereafter "Ittycheriah").

Claims 27 and 28 depend from independent claim 26. As noted above, Levinson fails to disclose or suggest all the features of independent claim 26. Additionally, Ittycheriah fails to overcome the deficiencies noted above in Levinson.

Ittycheriah discloses speech recognition using thresholded speaker class model selection or model adaptation. However, Ittycheriah fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition.

Accordingly, claims 27 and 28 are not unpatentable, or otherwise rendered obvious, over Levinson in view of Ittycheriah based at least on their dependency from independent claim 26.

In the Office Action, claims 29-34, 46 and 47 have been rejected under 35 USC 103(a) as being unpatentable over Levinson in view of Stanely et al. (US Patent No. 5,684,924, hereafter “Stanely”).

The Applicant has amended independent claims 29, 46 and 47 to be consistent with the suggestions made during the Examiner Interview. Independent claims 29, 46 and 47 have been amended similarly to independent claim 26. That is, claims 29, 46 and 47 have been amended to point out that the reference model storing unit of the present invention is “operable to store a plurality of reference models which are probability models showing an acoustic characteristic having a specific attribute.”

Similar to independent claim 26, independent claims 29, 46 and 47 are directed to creating a standard model using statistics of at least one selected reference from a plurality of reference models stored in a reference model storing unit for producing a high-precision model for speech recognition.

In the Office Action, the Examiner relied primarily on Levinson for disclosing a reference model storing unit and standard model creating apparatus for performing speech recognition (see e.g., col. 5, lines 12-24, col. 6, lines 6-15 and col. 12, lines 42-62). However, as noted above, Levinson discloses a speech recognizer that recognizes speech pattern using a Markov model. Thus, Levinson simply discloses speech recognition directly using a reference model (i.e., Markov model).

Levinson fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition.

Stanely fails to overcome the deficiencies noted above in Levinson. Stanely discloses a speech recognition system that includes a core speech recognition program and a plurality of utility program modules for adjusting various recognition parameters such as gain, sensitivity and acceptance threshold; and for improving the training of word models. However, similar to Levinson, Stanely fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition, as in claims 29, 46 and 47.

Accordingly, independent claims 29, 46 and 47 are not unpatentable, or otherwise rendered obvious, over Levinson in view of Stanely. Likewise, claims 30-34 are not unpatentable, or otherwise rendered obvious, over Levinson in view of Stanely based at least on their dependency from independent claim 29.

In the Office Action, claim 35 has been rejected under 35 USC 103(a) as being patentable over Levinson in view of Stanely, and further in view of Zhao (US Patent No. 5,450,523 hereafter “Zhao”).

Claim 35 depends from independent claim 29. As noted above, Levinson in view of Stanely fails to disclose or suggest all the features of independent claim 29.

Additionally, Zhao fails to overcome the deficiencies noted above in Levinson in view of Stanely. Zhao discloses a model-training module that generates mixture Gaussian density models from speech training data for continuous or isolated word speech recognition. However, Zhao is silent with regard to creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition.

Accordingly, claim 35 is not unpatentable, or otherwise rendered obvious, over Levinson in view of Zhao based at least on its dependency from independent claim 29.

In the Office Action, claim 36 has been rejected under 35 USC 103(a) as being unpatentable over Levinson in view of Zhao; and claim 37 has been rejected under 35 USC 103(a) as being unpatentable over Levinson in view of Bielby (US Patent No. 5,488,652, hereafter “Bielby”).

The Applicants have amended independent claims 36 and 37 to be consistent with the suggestions made during the Examiner Interview. Independent claims 36 and 37 have

been amended similarly to independent claim 26. Claims 36 and 37 have been amended to point out that the reference model storing unit of the present invention is “operable to store a plurality of reference models which are probability models showing an acoustic characteristic having a specific attribute.”

Also similar to independent claim 26, claims 36 and 37 are directed to creating a standard model using statistics of at least one selected reference from a plurality of reference models stored in a reference model storing unit for producing a high-precision model for speech recognition.

In the Office Action, the Examiner relied primarily on Levinson for disclosing a reference model storing unit and standard model creating apparatus for performing speech recognition (see e.g., col. 5, lines 12-24, col. 6, lines 6-15 and col. 12, lines 42-62). However, Levinson fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition. Also, as noted above, Zhao also fails to disclose or suggest the above features.

Bieibly discloses an apparatus for partially automating a telephone directory assistance function, wherein a speech recognition algorithm is applied to speech signals received. Thus, Bieibly also fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition, as in claims 36 and 37.

Accordingly, independent claims 36 and 37 are not unpatentable, or otherwise rendered obvious, over Levinson in view of Zhao or Bieibly, respectively.

In the Office Action, claim 38 and 39 have been rejected under 35 USC 103(a) as being unpatentable over Levinson in view of Bielby, and further in view of Ittycheriah.

Claims 38 and 39 depend from independent claim 37. As noted above, Levinson in view of Zhao or Bieibly fails to disclose or suggest all features recited in claims 37. In particular, Levinson in view of Zhao or Bieibly fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition.

Moreover, as noted previously, Ittycheriah also fails to disclose or suggest the above features of claim 37. Specifically, Ittycheriah discloses speech recognition using thresholded speaker class model selection or model adaptation. However, Ittycheriah is silent with regard to creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition, as in claim 37.

Accordingly, dependent claims 38 and 39 are not unpatentable, or otherwise rendered obvious, over Levinson in view of Ittycheriah based on their dependency from independent claim 37.

In the Office Action, claims 40-43 have been rejected under 35 USC 103(a) as being unpatentable over Levinson in view of Campbell (US Patent No. 6,038,535, hereafter “Campbell”).

The Applicant has amended independent claim 40 to be consistent with the suggestions made during the Examiner Interview. Specifically, independent claim 40 has been amended similarly to independent claim 26 (i.e., to point out that the reference model storing unit of the present invention is “operable to store a plurality of reference models which are probability models showing an acoustic characteristic having a specific attribute”).

Also, claim 40 is directed to creating a standard model using statistics of at least one selected reference from a plurality of reference models stored in a reference model storing unit for producing a high-precision model for speech recognition.

In the Office Action, the Examiner relied primarily on Levinson for disclosing a reference model storing unit and standard model creating apparatus for performing speech recognition (see e.g., col. 5, lines 12-24, col. 6, lines 6-15 and col. 12, lines 42-62). However, as noted previously, Levinson simply discloses speech recognition directly using a reference model (i.e., Markov model). Thus, Levinson fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition.

Campbell fails to overcome the deficiencies noted above in Levinson. Campbell discloses a simplified classifier and training system, which includes the use of speech

models stored in a memory. However, similar to Levinson, Campbell only discloses speech recognition using the speech models (i.e., reference models) directly. Thus, similar to Levinson, Campbell fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition, as in claim 40.

In the Office Action, claims 44 and 45 have been rejected under 35 USC 103(a) as being unpatentable over Levinson in view of Ittycheriah.

The Applicant has amended independent claims 44 and 45 to be consistent with the suggestions made during the Examiner Interview. Specifically, independent claims 44 and 45 have been similarly amended to that of independent claim 26 (i.e., to point out that the reference model storing unit of the present invention is “operable to store a plurality of reference models which are probability models showing an acoustic characteristic having a specific attribute”).

Independent claims 44 and 45 are directed to creating a standard model using statistics of at least one selected reference from a plurality of reference models stored in a reference model storing unit for producing a high-precision model for speech recognition.

In the Office Action, the Examiner relied primarily on Levinson for disclosing a reference model storing unit and standard model creating apparatus for performing speech recognition (see e.g., col. 5, lines 12-24, col. 6, lines 6-15 and col. 12, lines 42-62). However, Levinson fails to disclose or suggest creating a standard model from at least one reference model selected from a plurality of stored reference models, wherein the standard model can be used for performing speech recognition. Moreover, as previously noted, Ittycheriah fails to disclose or suggest the above features.

Accordingly, independent claims 44 and 45 are not unpatentable, or otherwise rendered obvious, over Levinson in view of Ittycheriah.

With regard to new independent claims 48-56, the claims also include the features that were suggested during the Examiner Interview. That is, claims 48-56 similarly recite that the reference model storing unit of the present invention is “operable to store a plurality of reference models which are probability model showing an acoustic characteristic having a specific attribute,” as in independent claims 26, 29, 36, 37, 40, and 44-47.


Additionally, new claims 48-56 recite the feature "wherein the standard model is created from the at least one reference model and the standard model is used for speech recognition." This feature is provided to clarify that the created standard model, and not the reference model, is used for speech recognition.

Accordingly, new claims 48-56 are not anticipated or rendered obvious by the cited prior art for similar reasons noted above for independent claims 26, 29, 36, 37, 40 and 44-47.

In light of the above, the Applicant respectfully requests that the Examiner withdraw the previous objections and rejections in the Office Action and pass the application to issue. The Examiner is invited to contact the undersigned attorney by telephone to resolve any remaining issues.

Respectfully submitted,

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